Natural Resources and Environmental Issues

Volume 9 *University Education in Natural Resources*

Article 56

2002

Looking before we leap: A three-part study to prepare for college reorganization

Claudia L. Anderson
Department of Forest Resources, Utah State University, Logan

Mark W. Brunson
Department of Forest Resources, Utah State University, Logan

LOOKING BEFORE WE LEAP: A THREE-PART STUDY TO PREPARE FOR COLLEGE REORGANIZATION

Claudia L. Anderson[1] and Mark W. Brunson[2]

[1]Undergraduate Research Assistant, Department of Forest Resources, Utah State University, Logan, UT 84322-5215.
[2]Associate Professor, Department of Forest Resources, Utah State University, Logan, UT 84322-5215. E-mail: brunsonm@cnr.usu.edu

ABSTRACT: In Spring 2001 the College of Natural Resources at Utah State University voted on a plan for reorganization of departments and curricula that is intended to better reflect future natural resource science and management needs. To prepare for curriculum redesign we evaluated the career objectives and educational needs of undergraduate students in natural resources and related fields by means of a three-part study of relevant groups: current students, public agency professionals, and prospective students who chose nonnatural resources majors. Students typically seek traditional jobs with public agencies, but a large proportion also expect to attend graduate school. Comparison of seniors and underclassmen found that the latter were less pragmatic in their expressed career goals, and also showed greater appreciation for the human dimension of natural resources management. Agency professionals identified "people skills" as critical to success in public land management, and expressed a wish that they'd had more of those kinds of courses in college. About half reported that their jobs were quite different from what they'd anticipated as students. Focus groups with nonnatural resources majors found that these students had strikingly similar career goals but felt majors in natural resources are too narrow, too scientific, and/or too unscientific to help them achieve those goals. Implications for the college as it undertakes reorganization is that curricula should continue to balance natural science and statistics courses with classes that provide understanding of people. Improved advisement could help students gain more realistic expectations about their futures. In addition the college may want to consider efforts to better market itself within the university.

INTRODUCTION

The faculty of the College of Natural Resources (CNR) at Utah State University (USU) voted in Spring 2001 on a reorganization plan that reduced the size of the college from four to three departments, which have been reconfigured to reflect beliefs about the knowledge and skills that are most likely to be needed to address the most challenging issues of the upcoming decades. Curricula of the college's undergraduate majors are to be redesigned to fit these new priorities and the strengths of the new departments' faculties. College administrators anticipate that these new, stronger curricula will be designed to retain current CNR majors, recruit potential students, and, ultimately, produce more effective natural resource managers.

At the time of the reorganization vote, the college consisted of four departments which offered Bachelor of Science degrees in the following majors (in parentheses): Fisheries and Wildlife (Fisheries and Wildlife); Forest Resources (Environmental Studies, Forestry, Recreation Resource Management); Geography and Earth Resources (Geography); and Rangeland Resources (Rangeland Resources). An interdepartmental program in Watershed Science also offered a Bachelor of Science degree. After reorganization the majors were redistributed to three new departments as follows:

- Department of Aquatic, Watershed and Earth Resources (AWER): Watershed Science, fisheries portion of Fisheries and Wildlife.
- Department of Environment and Society (EnvS): Environmental Studies, Geography, Recreation Resource Management.
- Department of Forest, Range and Wildlife Sciences (FRWS): Forestry, Rangeland Resources, wildlife portion of Fisheries and Wildlife.

As this is written, the AWER and FRWS departments are pursuing new undergraduate majors that reflect their expertise in aquatic ecology and earth systems science, and ecosystem restoration and conservation biology, respectively.

This study was designed to assist in curriculum development and the reorganization process by means of case studies of three relevant groups. The groups, and the research objectives within each, were as follows: current CNR students, to identify educational and career goals; public agency professionals, to identify courses and skills necessary for natural resource management positions; and students in closely related, non-CNR majors, to identify educational and career goals and reasons for choosing other majors.

THREE RELATED STUDIES

Because reorganization was intended to strengthen CNR curricula and make them more relevant to current and future problems, we need to be able understand what current and future natural resources professionals need and want from an undergraduate education. Because it was also intended to help the college become more attractive to future students, we also needed to understand why students choose—or do not choose—CNR majors. Accordingly we undertook three separate but related studies, each of which applied methods of the social sciences to better understand important constituencies. We surveyed students in four of the college's larger required courses—two that consist primarily of lower-division students ("Professional Orientation to Forest Resources"; "Natural Resources and Society") and graduating seniors ("Quantitative Assessment for Natural Resources"; "Ecosystem Management"). In addition, we interviewed employees at two federal land-management offices. Finally, focus groups were organized to gather information from students who were identified as "likely" CNR majors but had chosen other programs.

Current Natural Resources Students

Surveys of CNR students were designed to better understand the people who are currently pursuing natural resource degrees: Why have they chosen those majors? How do they feel about the education they are receiving?

Are they satisfied with their choices of majors? Do they feel prepared to enter natural resource management professions? A total of 139 surveys were collected from four classes between November 2001 and January 2002. Of those surveyed, 65 (47%) were seniors and 74 (53%) members of other graduating classes. The classes were selected in order to get a broad cross-section of CNR majors and, in further analysis, to compare freshmen and seniors. The major with the largest number of respondents was Fisheries and Wildlife (28% of surveys), followed by Environmental Studies (25%), Recreation Resource Management (15%), Forestry (11%), Geography (10%), Rangeland Resources (7%), and Watershed Science (3%). This distribution roughly represents the proportions of majors within the college except that Environmental Studies and Recreation majors were slightly oversampled and Fisheries and Wildlife and Geography majors slightly undersampled.

When asked why they chose a natural resources major, every respondent expressed interest in nature and its management or protection. Lower classmen more often identified reasons such as "I love nature" or "I want to work outdoors" than seniors. Seniors more often cited employment after graduation or internships and jobs while in school than did other students. Non-seniors were more interested in human dimensions of natural resources and their integration with ecology than seniors, who were slightly more interested in specific topics and components of ecosystems (wildlife, trees, etc.).

Most students want to work in the public sector, with 46% seeking careers with public land-management agencies and 15% with state or local governments. The next most frequently mentioned categories were environmental consulting firms (7%) and research organizations (6%).

One question that particularly interested us was "If you had your college education to do over, would you do it differently?" A majority (68%) indicated they would not change their college educational path. Not surprisingly, seniors were slightly more likely to express regret at their choice (38% of all seniors) than underclassmen (26%), who had not yet had time to experience most of the courses in their majors. Of the minority of students who wished they'd done things differently, a majority would have chosen a different major within the college, or would have taken less time to settle upon a major. Those who wish they had chosen a major outside the college typically said they would have found more options and better financial stability with a non-CNR major.

Increasingly students are told—by their teachers or faculty advisors, or by others outside the university—that they will not be able to reach their career aspirations without obtaining a graduate degree. Because of this circumstance, and because the faculty have an ongoing debate about whether their primary purpose is to prepare students for management careers or for graduate study, we were especially interested in learning more about students' plans for advanced degrees. Just over half of CNR students (56%) want to pursue a graduate degree. A Master's degree is the most sought-after, desired by 74% of those planning to attend graduate school. However, grade-point averages of students anticipating graduate degrees suggest that many students will be disappointed to learn their GPAs are too low for admission to graduate school (Table 1).

Table 1. Are Plans for Graduate Education Realistic?

Status	Do you plan to attend graduate school?	Cumulative GPA % responses					Total %
		4.0-3.5	3.4-3.0	2.9-2.5	2.4-2.0	<1.9	
Seniors	Yes	20	23	16	3	0	63
	No	5	16	14	3	0	38
Non-Seniors	Yes	17	22	10	4	1	54
	No	17	14	13	3	0	46

Public Agency Professionals

If most CNR majors want to end up working for a federal agency, then it's important to understand what skills are likely to be necessary for successful careers in public land agencies. Accordingly the senior author interviewed employees at two U.S. Department of Interior offices: the Bureau of Land Management field office in Monticello, Utah, and National Park Service office at Glen Canyon National Recreation Area headquartered in Page, Arizona. The sample group was comprised of natural and cultural resource managers, including both permanent and temporary employees. The study was designed to be a qualitative analysis, not to provide statistically significant (quantitative) data, although numeric data were gathered and are reported where appropriate in figures and tables. A total of 25 interviews (of 27 total employees) were conducted ranging from 10 minutes to 2 hours.

A synthesis of data obtained from the interviewees found that for most a college education provides

- A baseline education and introduction to issues professionals would face
- Basic understanding of law, rights, environmental evidence, and decision making
- A learning environment for integrity and professionalism
- A scientific background and an analytical approach for making management decisions

However, nearly half found their current jobs to be completely different than what they anticipated while they were in college. Similarly, only half recognize a strong correlation between their college education and their current jobs. Those with the most pinpointed career goals found the most relevance; those with broad goals found varying degrees of relevance. Among the aspects of their jobs that interviewees did not anticipate were

- Extensive involvement with people, supervising, and interaction with various interest groups
- The decline in fieldwork and increase in office supervision associated with job advancement
- Inflexibility of a bureaucracy coupled with the influence of politics
- A great deal of office work

The college courses that respondents judged most valuable were math and science (76% of respondents) and human dimensions classes such as policy or archaeology (32%). Twenty percent said their most valuable college experiences had been the completion of a Master's thesis or large research project, because those kinds of activities gave valuable practice at independently completing large projects with distant or indistinct deadlines. The consensus was that college classes gave agency professionals an adequate foundation, while job training and experience filled in gaps. When asked what classes they wished they'd taken, the most common categories of courses were human relations, computers, technical training, science, and statistics.

When asked what skills (as opposed to specific courses) were most necessary to a successful agency career, a surprising 80% mentioned people/communication skills such as teamwork, interpersonal relationships, public speaking, confrontation and negotiation, and supervisory techniques. Other skills mentioned by one or more interviewees included science; writing; organization; budgeting; math/statistics; and practical application of theoretical concepts.

Although respondents nearly unanimously found value in their college educations, many felt unprepared in certain aspects of their current jobs, especially dealing with people. They identified a need to learn within the context of management and law, and many respondents felt that these skills cannot be taught in college. Agency professionals emphasized a need for technical competency, knowledge of the sciences, and the ability to interact with people.

Students in Closely Related Majors

There are many opportunities to pursue a career associated with natural resources and the environment, including majors that offer environmental curricula outside the College of Natural Resources. Our work with this group examined many of the same topics as in the study of CNR majors—What factors led to their decision to pursue their current majors? What are their specific career goals?—but also was intended to discover why students chose a major dealing with nature and the environment outside CNR.

We convened focus groups where we conducted informal conversations over pizza, lasting approximately one hour, with students in several different majors with small-enrollment programs having a focus on nature and the environment. These majors included Landscape Architecture and Environmental Planning, American Studies, Parks and Recreation, and Environmental Soil and Water Science. In addition we contacted student employees of the university's Outdoor Recreation Center.

Since we suspected that decisions not to major in the college were related to the CNR image, we asked focus group participants the question, "What comes to mind when you hear 'College of Natural Resources'?" The answers came in two primary categories, people and topics:

- People: Paul Bunyan (a somewhat controversial symbol of the college featured prominently in some student activities), great professors and friends, "big-bearded fellows with beefy waist belts [and] coffee mugs, carabineered to backpacks," "liberals and granolas"
- Subjects: Forestry, Range, Environmental Studies, nature, policy, "opinionated science," government agencies.

Discussions with the sampled groups suggested that non-CNR majors understand the complex nature of natural resource management but feel they can approach environment-related careers from other angles. When asked why they did not choose a CNR major, most respondents said they had considered and rejected the college, although a few didn't even know it existed until joining the focus groups. Some participants said the college's majors are "too ecological" while others felt the curricula contain too much social science. The college's approach was said to be "too narrow" by some students, who said there were no appealing degrees within the college. Others said CNR majors wouldn't offer them the kinds of careers they desired because natural resource management careers don't pay well or "It's easier to save the world with a different degree." However, the desired jobs and training of these students were strikingly similar to those of CNR undergraduates. Focus group participants typically want to work for a government agency, state/local government, nonprofit environmental group or a private environmental firm. When asked whether they had chosen the "right" major, the answer was a resounding "Yes!" Not one would have opted for a CNR major at this point in his education.

NOW WHAT? IMPLICATIONS FOR CURRICULUM REDESIGN

As a reorganized College of Natural Resources considers new majors and revises existing ones, results of this survey can inform the curriculum design process. Some of the themes we see in our results are

1. Strike a social/ecological balance: Agency professionals identified a need for better "people skills," but also for technical expertise and computer competency. The deficiencies they identified in their college educations might be eliminated by requiring classes and field experience that can provide students with a basis of all three identified needs. Curriculum should reflect current informational technologies, and field and technical skills should remain as a major emphasis of natural resources curricula, but designers of the new curricula should beware the pitfalls of reducing human dimensions content to provide a stronger basic science foundation.

2. Reinforce communication skills as often as possible, through specific courses in communication but also by incorporating principles of "writing and speaking across the curriculum" in the college's own courses.

3. Improved advising: One of the more striking findings of this study was a disconnection between the expectations of students to attend graduate school and academic attainments of some of those students. Utah State University, like many western land-grant universities, has an open-admissions policy for undergraduates whereby nearly all high school graduates are granted admission to college. As a result, students may be unaware of the entrance requirements for graduate schools. Conversely those entrance requirements are second nature to faculty members who may assume their students are equally aware of the rules. Faculty advisors should discuss graduate school plans with their advisees as soon as possible so that the need for academic success can be emphasized early in the undergraduate career.

   A second advising issue is with non-majors, many of whom may have investigated the College of Natural Resources at some point as high school seniors or recent arrivals at the university. Many of the non-majors we contacted were unaware of the breadth of options within the college, and therefore rejected its programs as being too narrow, too science-oriented, or not science-oriented enough.

4. Intra-university marketing: A related issue is the overall image of the College of Natural Resources. Not only does it appear that Utah State students are unaware of the breadth of the programs within the college, they also appear unaware of the breadth of the students, who are often seen as either unusually liberal for a relatively conservative university in a conservative state, or else as too conservative to meet the needs of someone who wants to "save the world." It seems that one factor in the college's "image problem" is the symbolism of the mythic lumberjack Paul Bunyan, represented by a large chainsaw sculpture that is featured prominently in the annual Natural Resources Week celebration.

5. Continue monitoring CNR students: Much of the information obtained by this study was unknown to college faculty. We recommend repeating this study at regular intervals so faculty and administrators can keep tabs on who their students are, where they are coming from, and where they want to end up.

ACKNOWLEDGMENTS

The authors would like to thank the following people for their assistance with this project:

- Mary Cheney for helping conduct focus groups
- Associate Dean Raymond Dueser for financial and moral support
- Professors Terry Sharik, Layne Coppock, and David Anderson for giving us valuable class time for surveys
- Every student who took time to give us his or her thoughts about natural resources education